



Inter-Society Color Council News

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July/August 2003

Letter from ISCC President

The summer is rolling by quickly. I attended the CIE Quadrennial meetings the end of June in San Diego. They were successful but as nearly everything - the attendance was down. There has been much progress within the CIE in the past four years. CIEDE2000 is being field tested and the Division is looking for reports from labs who are comparing CIEDE2000 to CMC or CIE94 or even CIELAB for effectiveness in predicting commercial tolerances. The same is true for CIECAM02 - a new color appearance equation. So, if you are looking into any of these new equations and have accumulated some comparative results send a copy to the CIE. You can find addresses for the relevant committee chairs on the CIE world-wide web site.

Currently the Board is focusing on next spring's meeting. It will be a joint meeting with the Council on Optical Radiation Measurements (CORM) and will be held in Gaithersburg, Maryland at NIST. The focus of the meeting will be on standards, uncertainty and accuracy in color measurements. There will be tours of the laboratories at NIST. Please mark your calendars for May 9-14, 2004 for this exciting meeting.

I have also received word recently from Professor Margaret Miele that Fashion Institute of Technology / SUNY in New York will be hosting a Williamsburg-like conference in the fall of 2004. The general topic will be color in design and color psychology. I do not have any more details at this time but watch our future issues of ISCC News for those details.

I have also just completed negotiations with the IS&T to co-sponsor a similar symposium in the fall of 2005 after the annual Color Imaging Conference in Scottsdale, Arizona. This will be a deeply focused meeting targeting color measurement in the graphic arts. With the introduction of new indices like CIECAM02 and the RIT/CAM spatial color difference metric there will be much to discuss by the fall of 2005.

If there are any other topics related to color measurement or communication that might be of interest to you and your industry drop me a line and I will try to get an interest group or meeting coordinator to put together a program on that topic. See you next May at NIST.

Danny Rich

ISCC EXECUTIVE OFFICERS

President	<i>Dr. Danny Rich</i> Sun Chemical Research 631 Central Avenue, Carlstadt, NJ 07072 201-933-4500x1144 fax 201-933-5658 richd@sunchem.com
President-Elect	<i>Dr. Joanne C. Zwinkels</i> National Research Council of Canada Inst. for National Measurement Standards M-36, Montreal Road Ottawa, ON K1A 0R6 Canada 613-993-9363 fax 613-952-1394 joanne.zwinkels@nrc.ca
Secretary	<i>Mr. John McCann</i> McCann Imaging 161 Claflin Street, Belmont, MA 02478 617-484-7865 fax 617-484-2490 mccanns@tiac.net
Treasurer	<i>Mr. Hugh Fairman</i> 503 Bradley Court, Princeton, NJ 08540 609-430-1630 fax 609-430-1618 resourceiii@erols.com
Past-President	<i>Mr. Jack Ladson</i> Integrated Color Solutions, Inc. 1000 Plowshare Rd., Yardley PA 19067 215-369-5005 fax 215-369-3191 jack.ladson@icscolor.com

ISCC BOARD OF DIRECTORS**2001-2004**

Mr. James G. King	DuPont Performance Coatings 945 Stephenson Hwy, Troy, MI 48007 248-583-8276 fax 248-583-8316 james.g.king@usa.dupont.com
Dr. Eileen Korenic	Univ. of Wisconsin-River Falls, Physics Dept. CSH, River Falls, WI 54022 715-425-3560 fax 715-425-0652 eileen.korenic@uwrf.edu
Prof. Margaret Miele	Fashion Institute of Technology/SUNY Dept. of Social Sciences 7th Ave @ 27th St., NY, NY 10001-5992 212-217-8449 fax 212-217-7095 mielemar@fitsuny.edu

2002-2005

Dr. Karen M. Braun	Xerox Corporation 800 Phillips Rd., MS 128-27E, Rochester, NY 14580 585-422-6380 fax: 585-422-6117 kbraun@crt.xerox.com
Mr. Johnny Suthers	Eastman Chemical Company P.O. Box 511, Kingsport, TN 37662-5065 423-229-3263 fax: 423-229-4205 jsuthers@eastman.com
Ms. Lisa Thieme	Colwell Industries, Inc. 2605 Marion Drive, P.O. Box 308 Kendallville, IN 46755 260-347-3900x3372 fax: 260-347-2079 lisat@colwellind.com

2003-2006

Mr. David Battle	GretagMacbeth LLC P.O. Box 14026 79 T.W. Alexander Dr., 4401Bldg, Suite 250 Research Triangle, NC 27709-4026 919-549-7575 fax: 919-549-0421 battle@gretagmacbeth.com
Mr. Sy Commanday	Techmer PM, LLC 1168 Palmour Drive Gainesville GA 30501 770-287-3929 fax: 770-287-0665 scommanday@techmerpm.com
Dr. Maria Nadal	NIST 100 Bureau Drive, Stop 8442 Gaithersburg, MD 20899-8442 301-975-4632 fax: 301-869-5700 maria.nadal@nist.gov

In Defense of the Lowly Meeting Report

Meeting reports, on conference after conference, toll in the years. After a while, they all look the same. No wonder meeting reports in journals are seen as less informative than other material. Some reports even appear without a byline, by tacit agreement of editor and author. But perhaps, sated though we are with meetings and their reports, we can be re-inspired by a look at the past.

I just emerged from an editorial position at *Physics Today*, which currently publishes no meeting reports. Because of my position, I obtained a copy of a republished Volume 1, No. 1 from May, 1948, and found there a familiar article called "Color Vision" by David MacAdam (pp. 10-13, 30-31). A well-written tutorial on color science of the time, MacAdam's article includes a diagram from Polyak's *The Retina* and a sprawling illustration of the entire causal chain of vision (from sun to objects to eye to brain to verbal and muscular response). I noticed for the first time that MacAdam's article was a summary of the 1947 International Conference on Color Vision in Cambridge, England. It was a meeting report!

MacAdam's report may not be a bibliometric record-breaker, but it is a valuable time capsule. ("After the interruptions of the war, ... , a welcome opportunity to exchange ideas.") Trichromacy of vision vied with a coalition of R. Granit's seven photochemical receptors, E. N. Willmer's rod-assisted color vision, and H. Hartidge's polychromatic theory. In anticipation of waveguide theories, S. L. Polyak posited only one kind of cone with "several processes initiated in each cone by different portions of the spectrum." W. D. Wright, S. Hecht, and D. B. Judd gave an effective defense of trichromatic theory, bolstered by G. Wald's evidence (which did not yet include his isolation of cone photopigments). Color discrimination, quantum thresholds, and opponent colors received mention, but not spatiotemporal effects or color constancy.

Despite my 2003 perspective, I found MacAdam's style refreshing and "new." It inspires me to write meeting reports that capture the spirit of "new" even in the current spate of conferences with their often recycled papers. It also tacitly teaches one how to recapture the "new": Get familiar with the past to appreciate what is new today.

Michael H. Brill, Datacolor



ISCC Welcomes New Members

- Mr. Spencer Berg** Ultra Blend Color LLC, 11406 Westinghouse Blvd.
Charlotte, NC 28273
Tel: 704-504-8969x16 Fax: 704-504-8839
Sberg@ultrablend.com
- Mr. Jerry Christoforatos** Benjamin Moore & Co., 360 Route 206 P.O. Box 4000
Flanders, NJ 07836 Tel: 973-252-2635
Jerry.christoforatos@benjaminmoore.com
- Mrs. Kim Gooding** Ciba Specialty Chemistry, 205 South James Street
Newark, DE 19804
Tel: 302-992-5720 Fax: 302-996-2990
Kim.gooding@msn.com
- Miss Celestine O. Ilori** The Sherwin Williams Co., 601 Canal Road
Cleveland, OH 44113
Tel: 216-515-4117 Fax: 216-515-4694
Celestine.o.ilor@sherwin.com
- Mr. Rick Helsen** Enterprise Color Solutions, 304 Frazer Drive
Yardley, PA 19067 Tel: 215-428-1011
Rhelsen@comcat.net
- Dr. Byron D. Jordan** Paprican, 570 St. John's Blvd.
Pointe-Claire, Quebec, Canada H9R3S9
Tel: 814-630-4100 Fax: 514-630-4134
Bjordan@paprican.ca
- Mr. Jeffrey C. Keith** 921 27th Street, Denver, CO 80205
Tel: 303-257-0492
Jeffccketh@earthlink.net
- Mr. Clarence Koehler** INX International Ink Co., 706 North Drive
New Buffalo, MI 49117
Tel: 269-469-3003 Fax: 269-469-3853
Clare.koehler@inxintl.com
- Dr. Milt Misogianes** Ciba Specialty Chemicals, 205 St. James Street.
Newport, DE 19804
Tel: 302-992-5241 Fax: 302-992-5650
Milt.misogianes@cibasc.com
- Ms. Erin Murphy** Rochester Institute of Technology, 113 East Squire Drive Apt #4
Rochester, NY 14623
Tel: 585-475-0531 Fax: 720-294-8330
Epmurphy@hotmail.com
- Dr. Maria Nadal** NIST, 100 Bureau Drive Stop 8441
Gaithersburg, MD 20878
Tel: 301-975-4632 Fax: 301-869-5700
Maria.nadal@nist.gov
- Ms. Teresa Rygiel** Benjamin Moore & Co., 32 Netcong Heights Apt. #1
Netcong, NJ 07857
Tel: 973-865-6785
Teresarygiel@aol.com
- Mr. Richard M. Scott** The Sherwin-Williams Co., 601 Canal Road
Cleveland, OH 44113
Tel: 216-566-3929 Fax: 216-515-4694
Richard.m.scott@sherwin.com
- Mr. Keith D. Smith** Esoteric Painting Design, 12550 Lake Ave. #1206
Lakewood, OH 44107
Tel: 216-521-3920 Fax: 216-521-3920
Esotericpd@yahoo.com
- Dr. Vicki J. Volbrecht** Colorado State University, Dept of Psychology
Ft. Collins, CO 80523-1876
Tel: 970-491-7553
Vickiv@lamar.colostate.edu

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ISCC 2003 Annual Meeting Interest Group II Report

Interest Group II's Session, which covers Industrial Applications of Color was chaired by Britt Nordby (Degussa Corporation), who is also the Interest Group Chair. The session had four papers in all.

The first paper was given by Dr. Richard Aspland (Clemson University) and was titled "Dependence of CMC Color Differences on the choice of Standard". Richard started by giving a brief description of the form of the CMC color difference equation and how it modifies the CIELAB equations. He described how the lightness, chroma and hue components are modified by factors S_L , S_C and S_H . He then showed plots of S_L versus L^* and S_C versus C^* . The first curve was flat for values of L^* from 0 to 16 and then increased smoothly after that. This is directly due to the definition of S_L in the equation. The other plot just showed a smoothly increasing S_C with increase in C^* . The final plot he showed was a contour plot on an a^* , b^* diagram of the S_H function for several values of C^* and h_{cb} . In a truly uniform color space these contours would be concentric circles about the origin. The contours he showed were not and the smallest contour was offset from the origin. Richard then went on to show that for color differences for the textile industry the non-symmetric nature of the CMC equation, with regard to choice of standard, was not critical. He also saw no significant benefit in moving from CMC color differences to CIECD2000 for the textile industry. He finished by saying that for the textile industry a CMC color difference of 0.6 ΔE was acceptable for sewing together and a 0.8 ΔE was acceptable for the color difference between the top of a suit to the trousers. The 2:1 form of the CMC equation was used for this data.

The second paper was given by Jack Ladson (ICSColor) and was titled "A Revolutionary Method for Real Time Rendering the Color Appearance of Products". Jack demonstrated a software package that allows real time color rendering. One of the main features of the software was the ability to rotate an object in three dimensions and have the rendering give a realistic display of the lighting and illumination changes that would occur if a real object was rotated under similar conditions. A "wire frame torso" of an object was computer generated first. This object was then covered with various materials. One material was a metallic type finish, which allowed you to see the specular and diffuse reflections based on the specified illuminating conditions. A second material showed a wood grain finish and its reflections.

Alberto Argoitia (Flex Products, Inc.) gave the third paper: "Special Effect Pigments by Thin Film and Diffractive Interference". Alberto started by describing the physics of their current products. The ChromaFlair product line has dramatic color shifts in a metallic type finish. The color of one of these flake pigments shifts from magenta through red, orange and gold into yellow. The color is produced by

light interference. A more recent product is called SpectraFlair. This pigment is described in their technical bulletin: "SpectraFlair pigment generates the appearance of multiple, bright rainbow producing prisms moving over a liquid silver color." The physics behind this pigment is similar to the ChromaFlair except that the rainbow effect is produced by diffraction. The diffraction is produced by crinkling the film in a very carefully controlled and reproducible way. The new product described in this paper combines the two techniques to produce a third family of flake pigments. They essentially add a rainbow effect to the dramatic color shift of the ChromaFlair pigments.

"Principle Components of Reflectances" was the title of the fourth paper of this session. Hugh Fairman (Resource III) presented this paper. He first defined what he meant by principle components. These are a limited number of functions that combine linearly to synthesize any member of the basis set. Principle components of reflectances are themselves reflectance functions. Hugh proceeded to cover the mathematical equations required to produce the principle components. The work used measured reflectance data from samples in the OSA, NCS and Munsell color systems for a total of 3,534 paint samples. The data indicated that acceptable reflectance curves could be derived from a set of tristimulus values and the first three principle components. If two sets of tristimulus values were used and the first six principle components then very good reflectance curves could be derived.

The final paper was: "Choosing the Best Aperture of Illumination and View for Characterizing the Color of Inks and Paint". Dr. Danny Rich (SunChemical Inks) presented this paper. Danny surveyed the typically available viewing apertures which are:

XLAV	> 25mm
LAV	15-25mm
SAV	7-14mm
USAV	3-6mm.

There are advantages and disadvantages for each of these. Small areas can be more uniformly illuminated but the lateral diffusion error (leakage of light out of the measurement area) is larger. Larger areas will average sample variations where as small areas will capture these variations. Dan presented data showing that a large amount of the available tolerance can be used up simply by a change in measuring aperture, e.g., when the size of the sample is changed. He finished the presentation with the following recommendations:

Ensure the uniformity of the paper the inks are applied to. It is critical.

Control the opacity of the paper; opacity is critical.

It is better to back the measured sample with an opaque white backing.

Britt Nordby, IG and Session Chair

News from RIT-MCSL

During Summer 2003, the RIT Munsell Color Science Laboratory (MCSL) will be celebrating the 20th anniversary of its founding and moving to new facilities. The Color Science Learning Center will be a combination of a state-of-the-art seminar room and a teaching laboratory for color science concepts and instrumentation serving as the focal point of MCSL.

Activities taking place in the new Color Science Learning Center will include

Lectures and laboratory Sessions for all RIT Color Science Courses,

Industrial Seminars on Color Science and Technology, and

Color Science Seminars, and Group Research Presentations.

Franc Grum was the first director of MCSL and the first R.S. Hunter Professor of Color Science, Appearance and Technology. He was responsible for initiating the development of a color science program at RIT. His untimely death caused a temporary hiatus to the program.

MCSL staff strive to live up to Franc's vision and standards of excellence. Periodically a Grum Memorial Scholarship is awarded to an outstanding graduate student. On this 20th Anniversary, faculty and staff would like to create another lasting legacy to Franc's work; the *Franc Grum Color Science Learning Center*. Their goal is to raise \$100,000 through contributions from alumni and friends. A bronze plaque will be placed outside the learning center to acknowledge those donating \$250 or more prior to Dec 31, 2003. Gifts are fully tax-deductible charitable contributions. Please send checks made payable to RIT to:

Munsell Color Science Laboratory
Chester F. Carlson Center for Imaging Science
Rochester Institute of Technology
54 Lomb Memorial Drive
Rochester, NY 14623-5604

Please indicate that the funds are to be allocated specifically to the *Franc Grum Color Science Learning Center*. If you are an RIT alumnus, your gift is eligible for trustee matching. Please indicate that in your letter along with the degree received and year of graduation.

For more information, contact Marc D. Fairchild, RIT, Munsell Color Science Laboratory or see their web page, <http://www.cis.rit.edu/mcs/about/fgcslc.html>.

The Color Association of the United States (CAUS) News

2003 is the 88th year of CAUS. Ever since its founding in 1915 the Association has been issuing and archiving its fashion and design colors at regular six-months intervals. These colors form an invaluable cultural record, which can be accessed by decade or by year or by a season.

Another important resource in the Association's library is the colname file. Over the years, each color has been given a descriptive name as well as a five-digit number called a cable number to identify it. Color names can be used as an inspirational tool in creating new names and stories for current lines. For example, looking under gold/golden there are 141 names listed, such as gold bar, gold flow, golden amber, golden capucine, golden chamois, golden Havana, golden spur, gold flake and gold wax. The name file also offers historical and cultural insights into the periods in which they were selected. Here are some examples.

Fall 1926 – Radio Blue: NBC was created in 1926 by a group of influential businessmen and began its radio broadcasts on November 15 of that year.

Spring 1929 – Rocket Red: Robert H. Goddard achieved the first successful flight with a liquid propellant rocket on March 16, 1926.

Fall 1931 – Mascara Brown: Mascara was originally advertised and sold by mail to women. Demand was so high that in September 1932 Maybelline introduced a 10-cent package of mascara for sale in the nation's variety stores.

Spring 1943 – Heroic Purple, Valiant Navy, Airman Blue, Loyal Red, Glory Green, Gallant Gold, Brave Blue, County Beige, Flight Gray: These were forecasted during WWII.

Fall 1953 – First Lady Pink: Mrs. Dwight D. Eisenhower wore a pink dress at her first Inaugural Ball, January 20, 1953. This color was dyed to match a fabric sample given by Mrs. Eisenhower. Neiman-Marcus, the Dallas department store, where the dress was purchased, described it as "Renoir Pink."

It is hoped that some of you wish to share with CAUS some of your experiences with vintage colors. How important is vintage color to your industry and where are you looking... clothing, ceramics, furniture...for vintage color inspiration? Are you a collector and does vintage play a part in your wardrobe? Your answers will be compiled and published in one of the future issues of CAUS News. Send responses to:

Margaret Walch and Karyn Valino
CAUS
315 West 39th St., Studio 507
NY, NY 10018
tel: 215.947.7774 fax: 212.594.6987

Color Research and Application In This Issue, August 2003

At the ISCC meeting in 1998, Calvin S. McCamy presented a demonstration of figures composed of a luminance distribution like a Mexican-hat function on a colored ground. Since some optic neurons respond when a small retinal area is illuminated, while the immediately surround area is dark, and others respond in the opposite way, he compared how the perceived color would compare to that of a simple colored dot. The appearance was quite remarkable; vivid, one might say. In our first article of this issue, McCamy discusses "Colors of Some Small Figures on Colored Grounds." It would appear that the visual system exaggerates contrast between a large spot and ground and diminishes contrast between a small dot and ground, but exhibits neither effect on a figure of some intermediate size. In this article he not only shows the figures and discusses the effect, but also describes how the figures are produced on a color monitor.

I remember vividly my disappointment when I viewed a photo that I had taken of the moon over a mountain in the late afternoon...in the photo there was no moon! The first time it happened I was shocked, although I understood the scientific principles at its cause. It has long been known that photographic negatives (and digital cameras) capture more information than can be reproduced on a photographic print or a video display. In the case of the photographic print, returning the negative to the processor with detailed instructions can change the print. However, this is not true with digital images. Most digital imaging systems archive only the rendered video image, so information is already lost, and can not be retrieved. While it would be desirable to use an extended dynamic range/color gamut encoding, there are also disadvantages because of compatibility issues. In our next article "Extending the Color Gamut and Dynamic Range of an sRGB Image using a Residual Image," Kevin E. Spaulding, Geoffrey J. Woolfe, and Regan L. Joshi describe a solution that maintains compatibility with existing file formats and software applications, while simultaneously retaining the extended dynamic range and color gamut information associated with the original scenes.

Thousands, if not millions, of Ishihara diagnostic plates, or other similar tests, have been used to assess color vision deficiencies throughout the world. One sometimes questions whether the diagnosis would be the same if another copy of the plates had been used. In our next article, David Y. Lee and Matthew Honson describe the "Chromatic Variation of Ishihara Diagnostic Plates." Lee and Honson compared both the chromatic and diagnostic variability of a total of 10 books from 5 different editions. Significant diagnostic variations were found among r-g deficient subjects. The authors were able to account for many of the diagnostic differences among books with the chromaticity and relative lightness variations, and therefore concluded that spectrophotometric analysis

may provide additional quality control for these plates.

For our next article we move to the topic of uniform color spaces. The Optical Society of America - Uniform Color Scales (OSA-UCS) were designed so that each color is surrounded by its 12 nearest neighboring colors that are supposed to be perceptually equally different from the central color. In the Swedish Natural Color System (NCS) the colors are arranged so as to vary gradually in each of the three perceptual attributes of hue, blackness and chromaticness. The two systems test for local uniformity by calculating differences in individual components. In our next article Tarow Indow describes "A Test of Uniformities in OSA-UCS and in the NCS." He uses a scaled color-difference metric and finds systematic differences between the distance coordinates in the two systems. According to Indow, the non-uniformities in the metric in different directions are not ascribed to defects in the metric, but rather suggests that something is not perfect when the standard color samples have been selected to meet the scheme of the system.

Yoshinobu Nayatani wrote the next two articles, which are also related to work with the NSC-type system. In recent articles in this journal Nayatani introduced a reference gray into an NCS-type system. An article by Hård, Sivik and Tonnquist published in this journal in 1996 also gave a definition for a gray region in the NCS system. In this issue in "A Modified Opponent-Colors Theory Considering Chromatic Strengths of Various Hues" examines these relationships as well as the procedure of assigning maximum chromaticness of 100 to the NCS pure colors. The result is a newly modified theory.

In the next article, "Adequateness of a Newly Modified Opponent-Colors Theory," Nayatani reports on the assessment of two of the features of the new theory. These two features are the perceived chroma of pure color for different hues, and the similarity between chromatic colors with the same values of whiteness, blackness, grayness, and perceived chroma. The analysis was done both theoretically and by using observations of samples selected from the Practical Color Coordinate System (PCCS).

For our final article of this issue, we move into the industrial arena of the optical characteristics of paint films. In 2001 Joshi, Vaidya and Shah published an article in this journal applying multi-flux theory to the problem of optical characterization of paint films. The scattering characteristics of a particle are related to the particle's size, shape, refractive index and the size distribution of the particles involved. Thus they relate to scattering characteristics of systems composed of homogeneous spherical particles can be computed relatively easily, but what happens when the particles are not spherical? Now Joshi and Shah are joined by Mehta to discuss this issue in "Application of Multi-flux Theory Based on Scattering by Non Spherical Particles to the Problem of Modeling the Optical Characteristics of Colored Pigmented Paint Film Part II".

We close this issue with two book reviews and two

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meeting reports. Heinwig Lang's *Colour and Its Reproduction, Part 1: Colorimetry* is reviewed by Robert T. Marcus. Then Rolf Bergman discusses *A History of Light and Colour Measurement, Science in the Shadows* by Sean F. Johnston. Three publications are briefly mentioned: *Spectral and Spatial Correction of Photometer* by Fryc followed by and CIE Publications S011/E and CIE 150:2003. Jose Caivano reports on the ArgenColor 2002 Meeting and their election of officers. Finally Francisco Heredia tells us about the Sixth Spanish Color Congress held in September 2002.

Ellen Carter, Editor, *Color Research and Application*

Evelyn Stephens Elected Honorary ISCC Member

Mrs. Evelyn Stephens was elected an Honorary ISCC Member. Honorary Membership is reserved for members who have rendered significant service to the ISCC or to fields served by the individual Member-Bodies of the ISCC, that aids in accomplishing the objectives of the ISCC.

Mrs. Stephens chaired ISCC Project Committee 40 on Color Education, Resources and Materials. She co-chaired Interest Group IV on Color Education.

Mrs. Stephens received her B.S. in Chemistry from Brooklyn College and her M.S. in Science Education from New York University. She has a number of additional graduate school credits in physics and mathematics.

Mrs. Stephens is currently retired. She had been a member of the faculty at The Fashion Institute of Technology since 1960, and she was Professor and Chair of the Science and Math Dept from 1973 until 1981.

She is a member of the American Association of Textile Chemists and Colorists (AATCC), ASTM International, the Color Association of the United States, Inc. (CAUS) and the Society for Imaging Science and Technology (IS&T).

ISCC 2003 Annual Meeting Interest Group I Report

Interest Group I was privileged to have four outstanding speakers presenting research in areas concerning:

- Role of rod receptor system's role in color vision.
- How visual perception is impacted by form and color.
- Comparison of different methods of color difference scaling
- Frequency-domain photon migration to determine the particle absorption spectrum of pigments

Dr. Joel Pokorny, Dr. Steven Shevell, Dr. Ethan Montag, and Mr. Yingqing Huang presented excellent talks on recent research performed at their respective universities. Stimulating discussion concerning the presentations followed the talks.

Milt Hardt, IG and Session Chair

BOOK REVIEW:

Expectations and the Food Industry: The Impact of Color and Appearance, by John B. Hutchings. Kluwer/Academic/Plenum, New York, 2003. \$125.00, \$69.00 paperback. (180 pp.). ISBN 0-306-47291-0.

Folks who have attended AIC meetings know John Hutchings as an engaging lecturer on three color-related topics: the food industry, folkways, and co-evolution of plants and animals. All three themes enter his latest book, *Expectations and the Food Industry*.

Of course, the food industry figures most prominently. Relative to his *Food Color and Appearance* (2nd Ed., Aspen, Gaithersburg MD, 1999), which deals with the coloring of the food itself, Hutchings enlarges the perspective to include store and restaurant environments, packaging, and advertising. The intended audience includes anyone in the food industry, and the book is well enough organized and approachable that it should appeal to a general audience. Technical terms are kept to a minimum; the only referents I found unfamiliar were the many British businesses he used as examples.

Folkways enter the book through various historical notes, particularly in the last chapter (on the appearance of food itself). An example: "The 'four and twenty blackbirds baked in a pie' was a seventeenth century method of creating temporal diversity of appearance at the table. This 'rev-ery pie' was blind baked and consisted of a real meat pie inside an empty pie crust. Live birds or frogs inserted into the cooled pie through holes in the base were released when it was cut open" (p. 161). Hutchings considers the choreography of food presentation important enough to have made it the final topic in his book.

In a section on food coloration (pp. 144-145), Hutchings discusses the co-evolution of flower and fruit color and the visual systems of animals that help distribute the pollen and seeds. The green of plant leaves and the red of meat are not part of this process: Plant leaves "reflect unwanted radiant energy" and use other radiation for photosynthesis. Meat is red because hemoglobin is a very good respirator.

Hutchings makes many observations about how color can affect the perception of food. For example, deepness of color is associated so profoundly with flavorfulness that we are likely to find colorful items flavorful as well. (I've found, though, that this rule does not extend to the extreme case of Petit Fours!) Table 5.1, which offers seven cultural taboos of marketing significance, seems particularly useful.

In chapters devoted to the do's and don'ts of designing and managing stores and restaurants, Hutchings brings to bear a lifetime as a consumer as well as an impressive set of credentials in food and color science. A section on "In-Store Irritations" (pp. 94-99) resonates with my own experience wandering around stores looking for particular merchandise.

Continued on page 8

Throughout the book, one is refreshed by Hutchings's wry humor. For example, in discussing the signal we give the waiting staff that we are finished eating in a restaurant: "In Britain the fork and knife are placed together on the plate. In the United States the signal may be the fork and knife placed apart at an angle" (p. 48). With respect to modern food crops: "Flavor seems largely to have been bred out and signs saying 'Grown for Flavor' admit to this" (p. 97). A more biting example: "Meals for the sick should be attractive, appealing, and appetising, even to the extent of sacrificing nutrition for short-stay patients" (p. 168).

The anecdotes, the observations, and the history all are strong points of the book. I am less impressed with the basic color science in Chapter 2 (Perception of Color and Appearance). One might get the impression from page 12 that good color vision is not necessary in the food industry, but Hutchings clarifies in his earlier book that color-vision screening is essential in certain trades. Hutchings notes here that faulty color vision has rarely produced disaster, but that probably means screening is effective, not that color vision lacks importance. The equations in the "Color Perception" section are also mysterious to me. Kobayashi's single-color image scale is not clearly explained; Green-Armitage's scale receives better treatment. In Chapter 3 (on lighting), I wish Hutchings had devoted more attention to lighting geometry as related to texture and "total appearance."

Hutchings begins each chapter with a short introductory section, "Expectations." Accordingly, I end here with some "expectations." Expect a multifaceted exposition by a color scientist who has really had fun in his career. Expect a consumer-advocate position that nonetheless counsels good manners by consumers. But also expect a bit less than \$125.00 worth.

Michael H. Brill, Datacolor

AATCC IC&E 2003

The AATCC 2003 International Conference & Exhibition will be held at the Palmetto Expo Center, Greenville, SC. The Keynote Address, "Speed to Market" via Color Innovation" will be given by Janet Littrell, Director Consumer Marketing, VF Corporation, Sept. 10. Littrell will describe a new color management process supported by a core technology suite.

Color is a central topic in many of the sessions. The Sessions include:

- From Concept ...,
- Fiber Innovations & Textile Testing,
- Digital Textile Printing,
- The Herman and Myrtle Goldstein Student Paper Competition,
- Color Science,
- Biotechnology,
- New Ideas,
- Preparation,
- Textile Care Developments,
- Fine-Tuned Processes,
- Advances in Dyeing,
- Environmental Concerns and Textile Testing,
- Educator's Roundtable: Color Academics and Industry Needs,
- Flammability,
- Technical Textiles,
- Roundtable Discussion with Apparels Magazine, Apparel's Color Management Roundtable Discussion, and
- Posters.

See <http://www.aatcc.org/ice/c2c.cfm> for more information.

ISCC 2003 Annual Meeting Interest Group III Report

The theme for the Interest Group III session was "Color Science is Creating a Modern Day Renaissance in Art & Design." We could not have had a better lineup of speakers. Our presenters were our new Education Chairperson, Prof. Margaret (Meg) Miele from the Fashion Institute of Technology in New York; our new Education Vice-Chairperson, Dr. Eileen Korenic, from the University of Wisconsin in River Falls and Mr. Paul Williams from BASF Corporation in Chicago.

Meg Miele presented "*The Modern Day Renaissance in Color*." She showed us how technology is a part of our everyday lives. Many of our children learn how to use a mouse before they can use a pencil. Multiple televisions with videos, surround sound systems and computers with internet connection twenty-four hours a day together with increased education and global awareness have altered our relationship with color. Meg explained how important it is for today's successful artists and designers to have the color savvy to satisfy today's sophisticated consumer.

Eileen Korenic presented "*Optical Technology and the Production of Visual Arts*." What an enlightening experience it was as Eileen put forward the Hockney/Falco theory that perhaps many of our great artists used optical devices such as the camera lucida, camera obscura or the magic lantern to assist them in creating their great masterpieces. Does the use of technology in the production of artwork lessen the value of the art? If so, where do we draw the line on what is visual artistry versus optic technology capability? Eileen showed us many examples of artist's work including some by van Eyck and Velasquez, which really made us, think about how they were created. Were there really as many left-handed people as were painted or was it a reflection that they were painting? She brought us right up to today's optical devices including the roto-reliefs of Marcel Duchamp in the 1930's to painting with laser light, holography and computer graphic design. Eileen clearly presented that art is not only artistic genius but creative technological skills as well.

Continued page 9

IS&T/SID's 11th Color Imaging Conf. "Color Science, Systems & Applications"

The 11th CIC conference is scheduled for November 4-7, 2003 at the Sunburst Resort in Scottsdale, Arizona. The range of professional areas represented will include: color science, color engineering, image processing, color reproduction, color printing, color displays, digital photography, image capture (color, multi-spectral, high dynamic range), color image quality analysis, visualization in color, color in computer graphics, psychophysics concerning human color vision, optical physics, color in systems engineering, and software and hardware development for color systems. In addition, submissions in the area of color in new display technologies are invited.

The paper program topics for the meeting are:

- Scientific Disciplines: Color Science, Color Appearance, Calibration, Measurement, Human Color Vision, Computer Vision, and Psychophysics
- Engineering Disciplines: Color Engineering, Color Displays, Color Scanning, Color Printing Technologies, and Color Management, Color Standards, Color Image Quality Assessment, Novel Developments for Color Imaging Products
- Color Image Synthesis/Analysis: Color in Computer Graphics, Color Rendering, Color Image Processing, Color Image Understanding, Color in Machine Vision
- Color Image Capture: Digital Still and Video Cameras, Multi-Spectral Imaging, High-Dynamic Range Imaging
- Applications: Graphic Arts, Color Printing, Internet, Web, Video, Motion Pictures, Television, Multimedia, Digital Photography, Visualization, Virtual Reality, Communications, and Image Retrieval

See <http://www.imaging.org/conferences/cic11/> for more information.

Paul Williams presented "*Lifestyle Trends and the Evolution of Color*" which, was actually a condensed version of a continuing education course that he does at the college level for Interior Design majors. He spoke about how we learn about, use and respond to color. Paul discussed our personal relationships with color including culturally and in our personality. We took an interesting look back at color trends over the past 25 years and into the future developing color focus groups, some of the members of which may someday do color forecasting for the marketplace. It was very informative and a pleasurable presentation that gave us good insight as to how students learn to design with color, use it and present it.

Our presenters did a wonderful job of showing us how science during the Renaissance and in today's technology has had and continues to have an impact on the work of artists and designers.

Georgia Kalivas, IG and Session Chair

AIC Colour 01 Symposia Videos -- Order Information and Form

All AIC Colour 01 meeting symposia were recorded, and videos are now available in NTCS and PAL format VHS tapes. The symposia included in the packages are:

- What is Color?
- The State of the Art and Future of Color Management
- Role of Color in the 3-D World
- How Should We Teach Color?
- The Artist and Digital Media
- How is CIE Helping Us Make Color Work?
- What is Color For?
- Color Issues for Digital Archives
- Environmental Color Design
- Spectral Imaging
- The Future of Color

The videos were digitally mastered and fully edited. They also include important discussions and papers that were NOT included in the AIC Color 01 Proceedings.

Please specify the package wanted. Note there is an additional cost of \$50 for PAL tapes. Shipping costs within the US are \$6.50, \$8 for Canada & Mexico and \$10 for all other countries. The video package includes four VHS tapes. Place an X next to the package you are interested in purchasing. No orders will be processed until payment is received for both the package and shipping.

NTSC Video Package:

- ☐ for U.S. Residents -- \$106.50
- ☐ for Canada & Mexico Residents -- \$108.00
- ☐ for Residents of all other countries -- \$110.00

PAL Video Package:

- ☐ for U.S. Residents -- \$156.50
- ☐ for Canada & Mexico Residents -- \$158.00
- ☐ for Residents of all other countries -- \$160.00

Checks are acceptable, but must be drawn on a US bank and be in US dollars. We also accept Visa, Discover, Master Card or American Express. Please send payment to:

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Please don't miss this unique opportunity to own the full series of AIC Color 01 symposia on video. Thank you for your interest in the most complete set of records for AIC Color 01.

Cynthia Sturke, ISCC Office Manager

CALENDAR

Please send any information on Member-Body and other organization meetings involving color and appearance functions to:

Ms. Cynthia Sturke

ISCC Office

11491 Sunset Hills Road, Reston, VA 20190

703-318-0263 tel

703-318-0514 fax

iscc@compuserve.com

website: <http://www.iscc.org>

2003

- July 28- Aug 1** Information Management Institute's 3rd Annual Digital Printing Summer Camp - EAST, Grand Summit Hotel, Sugarloaf, USA, Maine, www.imiconf.com.
- Aug 3-6** Illuminating Engineering Society of North America - IESNA Annual Conference, Chicago, IL. Contact Valerie Landers, IESNA 120 Wall St. 17th Fl, New York, NY 10005, www.iesna.org
- Aug 4-6** Midterm Mtg: AIC Color 2003 "Color Communication & Management" Bangkok, Thailand. Contact: aran@sc.chula.ac.th
- Sept 8-9** UMIST Visual Sciences Lab Conference, "LIMITS OF VISION - Space, Time and Colour", Manchester, United Kingdom, info@limits.org.uk
- Sept 9-12** AATCC's 2003 International Conference & Exhibition, Palmetto Expo Center in Greenville, SC. See <http://www.aatcc.org/ice/c2c.cfm> for more information.
- Sept 11** Detroit Colour Council Panel Discussion, Instrument Fair and Education Session on Color Measurement of Automotive Parts, www.detroitcc.org
- Sept 18-19** The Color Association of the United States, Inc., "Coloring the Future," 315 W. 39th St., Studio 507, New York, NY 10018 www.colorassociation.com.
- Sept 18-19** CMG's Canadian Regional Meeting Toronto, Canada, www.colormarketing.org
- Oct 5-9** Optical Society of America, 87th Annual Meeting, Hilton Tucson El Conquistador, Tucson, Arizona
- Oct 9-11** Colour Society of Australia, "Colour Communication 03", Melbourne Australia. Contact: Derek Grantham, derek@cathaypigments.com.au.
- Oct 12-14** Society of Plastic Engineers/Color and Appearance Division, 2003 Color & Appearance RETEC, Crowne Plaza Ravinia, Atlanta, GA www.specad.org.
- Oct 15-17** National Printing Ink Research Institute (NPIRI) 2003 Technical Conference in Laguna Cliffs Marriott Dana Point CA.
- Oct 24-25** CIE/USA and CIE/Canada Joint Annual Meeting, Montreal, Canada
- Nov 1-4** CMG's Fall International Conference San Francisco, Calif. www.colormarketing.org
- Nov 6** Automotive Color and Design over the Decades, Detroit Colour Council Meeting, www.detroitcc.org
- Nov 4-7** Eleventh Color Imaging Conference, Scottsdale AZ, www.imaging.org/conferences/cic11/
- Nov 12-14** FSCTs Annual Meeting and International Coatings Exposition, "Spirit of Innovation," Pennsylvania Convention Center, Philadelphia, PA, www.coatingstech.org

2004

- Jan 12-14** ASTM E12 Color and Appearance Meeting/Housing: Embassy Suites Hotel, Ft. Lauderdale, FL, in conj. with D01/G03
- Jan 18-24** IS&T/SPIE Electronic Imaging Conference 2004, San Jose Marriott and San Jose Convention Center San Jose, California USA, www.electronicimaging.org
- Apr 5-8** CGIV 2004 - Second European Conference on Color in Graphics Imaging and

Calendar (Cont.)

Vision, Technology Center AFIT, Aachen, Germany, www.imaging.org/conferences/cgiv2004/

- April 18-21** TAGA/IS&T 2004 San Antonio, Hyatt Regency Riverwalk Hotel, San Antonio, TX, Contact: TAGA at 585-475-7470, <http://www.taga.org>
- April 20-22** Color Pigments Manufacturers Association, Inc., "International Color Pigments Conference," Chicago, Ill.
- April 25-29** Society of Plastic Engineers/Color and Appearance Division, Chicago ANTEC, Navy Pier, Chicago, IL, www.specad.org.
- May 10-14** ISCC Annual Meeting and Symposium, Co-sponsored by ISCC and NIST, National Institute of Standards and Technology, Gaithersburg, MD. ISCC meeting will be May 10 and 11; May 12 will be joint meetings with tour of NIST laboratories; and May 13 and May 14 will be the CORM meeting
- May 17-19** ASTM E12 Color and Appearance Meeting, Gaithersburg, MD.
- May 23-28** ASPRS 2004 Annual Conference, "Mountains of Data — Peak Decisions," Adam's Mark Hotel, Denver Colorado, <http://www.asprs.org>.
- Sept. 15-17** CIE Expert Symposium on Image Acquisition and Display, Budapest, Hungary

International Coatings Expo - 2003

"The Spirit of Innovation" is the theme of ICE 2003. The event will be held at the Pennsylvania Convention Center in Philadelphia, PA, Nov. 11-14 and combines the International Coatings Expo Show, the International Coatings Technology Conference, and the FSCT Annual Meeting Program. The Technology Conference will offer a variety of programs on coatings manufacturing and application.

Technical papers will be presented during the FSCT 81st Annual Meeting to introduce attendees to the most innovative advances from the world of coatings. The preliminary program was announced by Chair, Dr. Raymond H. Fernando, of Cal Poly State Univ., San Luis Obispo, CA and is shown at <http://www.coatingstech.org/Programs/ICE.html>.

The Heckel Award/ Mattiello Memorial Lecture, "A Holistic Perspective of Coatings Technology" will be presented by Dr. Charles R. Hegedus, Air Products & Chemicals, Allentown, PA, Nov. 13. The topics of the technical session of the meeting include: Radiation/UV, Analytical Methods, Compliant Technologies, Corrosion, Coatings Formulations, Additives, TiO₂ in Coatings, and Non-Polluting Coatings.

Publications Available from ISCC Office

Color and Light by Fred W. Billmeyer Jr. & Harry K. Hammond, III. Authorized reprint from: ASTM Manual 17, Copyright 1996, ASTM International, 100 Bar Harbor Dr., W. Con-shohocken, PA 19428 \$5 ea or 20 copies/\$50.00

Demystifying Color by Bob Chung, 11 pages. Discusses and explains ten myths about color ... \$5 ea or 20 copies/\$50.00

Proceedings - 9th Congress of the International Colour Association, AIC Color 01 Rochester, Allan Rodrigues, Editor, papers given at technical sessions \$75*

*Plus shipping and handling

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\$ 100	business card-size ad
\$ 250	1/4 page ad
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\$1,000	full page ad

The editor reserves the right to determine the acceptability of the advertising. A 20% discount is available for a yearly contract.

Issue #404

July/August 2003

Editor: Prof. Gultekin Celikiz

tel: 215-836-5729

fax: 215-836-0448

celikizg@aol.com

Assoc. Editor: Cynthia Sturke

tel: 703-318-0263

fax: 703-318-0514

iscc@compuserve.com

Layout: Mary McKnight

tel: 301-975-6714

fax: 301-990-6891

mary.mcknight@nist.gov

All submissions must be in English. Please note that the submission of materials is due the first of each even numbered month. Materials submitted later will be printed in the following issue.

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Flex Products, Inc.	www.colorshift.com	707-525-7337
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 American Society for Testing and Materials International (ASTM)
 American Society for Photogrammetry & Remote Sensing (ASPRS)
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 Color Marketing Group (CMG)
 Color Pigments Manufacturing Association (CPMA)
 Council on Optical Radiation Measurements (CORM)
 Detroit Colour Council (DCC)
 Federation of Societies for Coatings Technology (FSCT)
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 Graphic Arts Technical Foundation (GATF)
 Illumination Engineering Society of N. America (IESNA)
 National Association of Printing Ink Manufacturers (NAPIM)
 Optical Society of America (OSA)
 Society for Information Display (SID)
 Society of Plastics Engineers, Color & Appearance Div.(SPE)
 Society for Imaging Science and Technology (IS&T)
 Technical Association of the Graphic Arts (TAGA)
 Technical Association of the Pulp and Paper Industry (TAPPI)

ISCC News Editor

Prof. Gultekin (Tek) Celikiz
celikizg@aol.com

1309 Paper Mill Rd, Erdenheim, PA 19038-7025
 215-836-5729 215-836-0448

ISCC Office Manager

Cynthia J. Sturke, Office Mgr.
iscc@compuserve.com

11491 Sunset Hills Road, Reston, VA 20190
 703-318-0263 703-318-0514

<http://www.iscc.org>